



## RESEARCH ARTICLE

# Key strategies, resources, and capabilities for implementing circular economy in industrial small and medium enterprises

Vanessa Prieto-Sandoval<sup>1</sup> | Carmen Jaca<sup>1</sup>  | Javier Santos<sup>1</sup> | Rupert J. Baumgartner<sup>2</sup> | Marta Ormazabal<sup>1</sup> 

<sup>1</sup>Universidad de Navarra, TECNUN, Escuela de Ingenieros, San Sebastián, Spain

<sup>2</sup>Institute of Systems Sciences, Innovation and Sustainability Research, University of Graz, Graz, Austria

## Correspondence

Carmen Jaca, Universidad de Navarra, TECNUN, Escuela de Ingenieros, Manuel de Lardizábal 15, 20018 San Sebastián, Spain.  
Email: cjaca@tecnun.es

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## Abstract

Small and medium enterprises (SMEs) are key actors in the implementation of the circular economy (CE) concept as a basis for creating sustainable societies. Thus, the main objective of this study is to identify key strategies and resources that may favor CE implementation in SMEs. These key strategies should encourage SMEs to develop eco-innovations to gain competitive advantage and create and capture value that is coherent with nature. A mixed-method approach that consisted of a literature review and a focus group for gathering qualitative data was used. This focus group was made up of experts such as researchers and practitioners from universities, sustainable SMEs, and consultancy firms in Spain. A set of strategies and internal and external factors were identified to help SMEs to implement the CE. Finally, some useful dynamic capabilities for implementing the CE in business performance were identified.

## KEYWORDS

circular economy, competitive advantage, dynamic capabilities, environmental management, SMEs

## 1 | INTRODUCTION

The current linear system of economic growth as well as the increasing social needs of global population means that the social prosperity and the resilience of nature require environmental management strategies toward the implementation of a circular economy (CE). The CE is defined as “an economic system that represents a change of paradigm in the way that human society is interrelated with nature and aims to prevent the depletion of resources, close energy and materials loops, and facilitate sustainable development through its implementation at the micro (enterprises and consumers), meso (economic agents integrated in symbiosis) and macro (city, regions and governments) levels.

Attaining this circular model requires cyclical and regenerative environmental innovations in the way society legislates, produces and consumes” (Prieto-Sandoval, Jaca, & Ormazabal, 2018).

In this context, small and medium enterprises (SMEs) have a key role in implementing the CE. According to the World Bank, SMEs are responsible for the majority of jobs in developed countries, and in emerging economies, they contribute up to 45% of total employment and up to 33% of national income (gross domestic product; Ayyagari, Demirguc-kunt, & Maksimovic, 2014). Proportionally, Calogirou et al. (2010) analyzed the data for the EU27 countries in Eurostat and estimated that SMEs cause approximately 64% of the industrial pollution in Europe. Therefore, the transition from linear to circular and

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sustainable business is urgent for manufacturing SMEs because they are responsible for a large part of the world's emission, use of resources, and generation of waste.

In this way, the Organization for Economic Co-operation and Development (2017) considers that SMEs are “central to the efforts to achieve environmental sustainability and more inclusive growth.” Accordingly, the development of an economy that get supplies from waste and makes better use of resources could reduce the negative impact of industries, from the largest companies to the SMEs. In this sense, the environmental goods and services or eco-industry are growing steadily (OECD, 2013), and the green jobs created in European SMEs are around 25 million, but the highest amount of green jobs are generated through retail and services sectors (with about 7 and 10 million, respectively; European Commission, 2015a). Thus, an environmental strategy and the development of eco-innovations can benefit the financial performance of SMEs, increase the market share, and create a competitive advantage (Aragón-Correa, Hurtado-Torres, Sharma, & García-Morales, 2008; Del Río, Carrillo-Hermosilla, & Könnölä, 2010; Iraldo, Kahlenborn, Rubik, Hertin, & Nielsen, 2005), especially when those eco-innovations are certified with eco-labeling schemes (Granly & Welo, 2014). Likewise, the CE offers a set of opportunities for SMEs such as the increase of prestige, cost reduction and financial profitability, recovery of the local environment, or sustainability of the company in the long term (Del Río, Carrillo-hermosilla, Könnölä, & Bleda, 2016; Ellen MacArthur Foundation, 2015; Moore & Manring, 2009; Noci & Verganti, 1999; Rizos et al., 2016).

Nevertheless, SMEs usually have limited technical and financial resources, and they may not see CE as one of their priorities because they are not aware of the benefits of the CE. Furthermore, governments and policymakers give limited support (Ormazabal, Prieto-Sandoval, Jaca, & Santos, 2016; Rizos et al., 2016). In this context, there is a clear risk of a vicious circle of unsustainable and reactive

environmental strategies in SMEs, which hinders CE implementation (Figure 1).

With the aim of providing advice to SMEs that want to break this vicious circle, the objective of this study is to identify and analyze the key strategies and resources that SMEs need in the CE framework to eco-innovate, build a competitive advantage, create value, and consequently, attain differentiation in the market. Additionally, this study proposes to classify these strategies and resources according to the CE fields and the environmental management maturity (EMM) level of the firms.

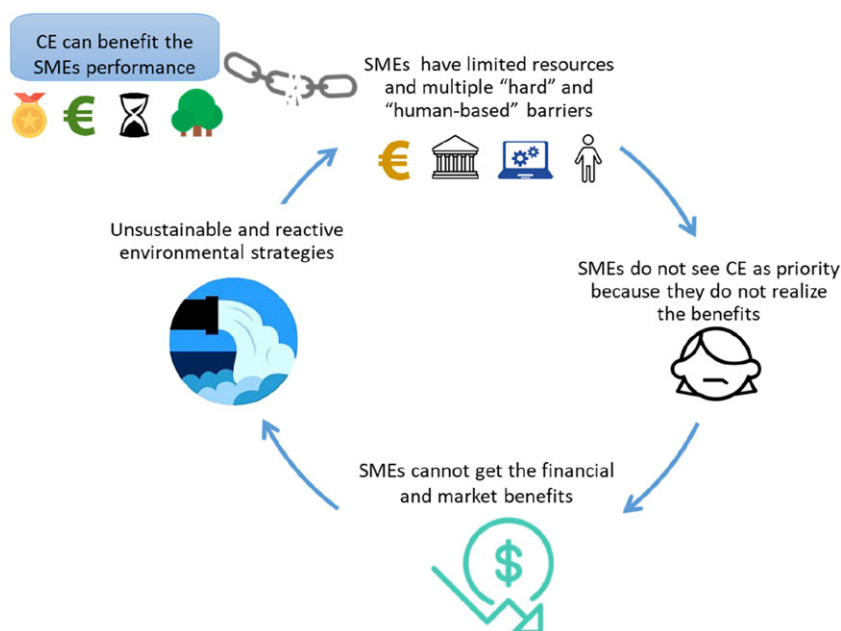
The paper is structured as follows. Section 2 presents the theoretical background for tackling the relationship between CE implementation in industrial SMEs and the creation of competitive advantage. Section 3 describes our research methods. Section 4 reports the results and discussion, and Section 5 presents the final conclusions.

## 2 | LITERATURE REVIEW

Regarding the environmental challenges and opportunities faced by SMEs, the literature review was oriented toward understanding the CE's fields of action. Following the literature review, this section presents a model to build a competitive advantage in SMEs in the CE framework.

### 2.1 | CE fields of action concerning SMEs

The CE makes feasible the economic development by proposing the recirculation of resources to deal with the economic growth expectation. If human societies pursue growth, they should be limited to the closed loop of resources and energy, resulting in a minimum amount of emissions (Geng & Doberstein, 2008; Lieder & Rashid, 2016). Therefore, the CE integrates economic development with environmental



**FIGURE 1** The vicious circle of unsustainable and reactive environmental strategies in small and medium enterprises (SMEs). CE, circular economy [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

sustainability by using environmental practices and technological innovation (Park, Sarkis, & Wu, 2010). This is possible through the value creation with sustainable business models based on extending firms activities along the product life cycle and the integration of firms with external partners to share service, cocreate products, recycling services, and so forth (Kortmann & Piller, 2016).

Wang, Che, Fan, and Gu (2014) state that CE is based on the “reduction, reuse, recycle” principle (3R principle) that is characterized by “low consumption, low emission, and high efficiency.” These principles are transversal and guide the CE's performance that can be understood in six fields of action: (a) take, (b) make, (c) distribute, (d) use, (e) recover, and (f) industrial symbiosis (Jaca, Ormazabal, Prieto, Santos, & Viles, 2018). In the CE, *take* refers to the way industries take resources and energy from the environment, which they then transform into goods and services (*make*). These goods and services are distributed by industries or firms at the point of sale (*distribute*). After that, goods and services are bought by diverse purchasers (including other companies) and *used* by consumers in the market. The CE boosts eco-innovation processes that *recover* the waste, materials, and energy that remain in the used products at the end of their life cycle (Park et al., 2010; Stahel, 2016). In this scheme, waste should be managed either as a biological resource or as a technical resource that may be redirected and returned to the biosphere or industrial processes, thus closing the loop (McDonough & Braungart, 2002). Finally, industrial symbiosis emerges when separate industries work together to develop the physical exchange of materials, energy, water, and by-products that create a competitive advantage for them in the market (Chertow, 2000; Porter, 1998). The industrial symbiosis emerged thanks to spontaneous and successful experiences like Kalundborg in Denmark (Jacobsen, 2006), as part of a local economic development strategy in the United States and Europe (Gibbs & Deutz, 2007) and the Chinese investment in eco-industrial parks (Zhang, Yuan, Bi, Zhang, & Liu, 2010; Figure 2).

Moreover, this closed-loop process must be supported by a systemic view; this requires industries and their stakeholders to maintain a steady and coordinated flow of materials, as proposed in industrial symbiosis theory (Ayres, 1989; Chertow & Ehrenfeld, 2012; Gibbs,

Deutz, & Proctor, 2005). Thus, the CE can be understood at three different levels of interaction: micro, meso, and macro. At the microlevel, firms produce sustainable goods and services in separate units. Then the integration of firms makes it possible to build the mesolevel, where industry and business associations, clusters, and eco-industrial parks may interact and stimulate industrial symbiosis (Ormazabal et al., 2016) and considerably improve their environmental performance indicators (Daddi & Iraldo, 2016). Besides, consumers and stakeholders (via nongovernmental organizations and consumer organizations) can stimulate CE activities (Jaca, Prieto-Sandoval, Psomas, & Ormazabal, 2018). Lastly, at the macrolevel, the (regional) governments, institutions, and societal values may trigger the CE in cities and countries through a suitable legal framework (Geng, Zhu, Doberstein, & Fujita, 2009; Pastore & Morello, 2018; Figure 2).

## 2.2 | Building competitive advantage in industrial SMEs with CE

Considering that the CE may offer the opportunity to build a competitive advantage for firms, this literature review examines what is a competitive advantage and the way to achieve it. The pioneering definition given by Porter (1985) explained that a competitive advantage exists when an organization can provide more value for its buyers than its competitors can through cost leadership or differentiation. Whereas Porter uses a market-oriented outside-in perspective, Barney (1991) looks at the core competences of a company that are described as the basis for creating a superior position on the market (inside-out perspective). He claimed that “a firm is said to have a competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential player.” But this competitive advantage is sustained during the time “when other firms are unable to duplicate the benefits of this strategy” (Barney, 1991).

The CE should be part of the SMEs' strategy for building a competitive advantage by providing value for its customers with greener



**FIGURE 2** Circular economy fields of action [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

products and services than those of their competitors. The environmental mature companies have learned that environmental improvements may have positive impacts on their prestige and profits (Ormazabal et al., 2016).

The design of a business strategy to get a competitive advantage starts by analyzing the interaction between external and internal factors (Del Río et al., 2016; Figure 3). External factors include public policy, market conditions, technological development, and stakeholders, whereas internal factors are the firm's resources, capabilities, and competences (RCCs). In this sense, some scholars have already tackled this topic with contrasting perspectives. On the one hand, the industrial management theory developed by Porter (1981) proposed to look for benefits by understanding the external factors to guide the use of available resources and capabilities.

On the other hand, the study of resources, competences, and capabilities started with Barney's (1991) pioneering work on the resource-based view, focused on the relevance of resources, that is, assets, capabilities, organizational processes, firm attributes, information, and knowledge, in obtaining a sustained competitive advantage in the long term for dynamic markets. Shortly after that, Teece, Pisano, and Shuen (1997) defined resources as "firm-specific assets that are difficult, if not impossible to imitate." For example, those resources can be tangible, such as infrastructure, or intangible, such as "know-how" and "know-who" (Alfaro, Mejía-Villa, Recalde, & Rodríguez-Ferradas, 2017; Chi, 1994).

The capabilities do exist when the resources have been integrated with the aim to develop one or multiple tasks in the firm. Moreover, capabilities are usually acquired through the development, learning, and exchange of knowledge of the staff. Some examples of capabilities may be the human talent selection, marketing, research and development, and the employees' abilities and knowledge (Dutta, Narasimhan, & Rajiv, 2005).

Competencies are the capabilities that become the sources of competitive advantage (Zott, 2003). In other words, every competence was a capability. In this light, the core competences are the most developed

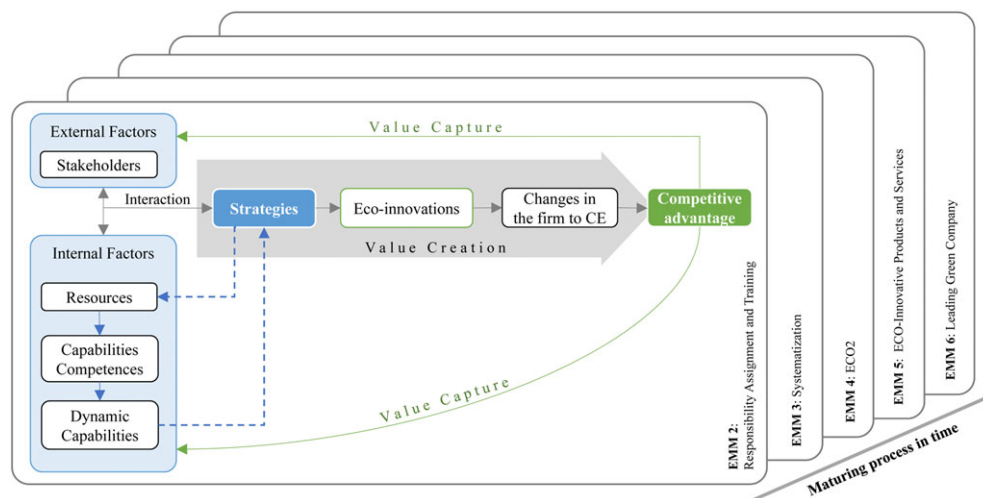
and experienced (Teece et al., 1997). Consequently, they are what make companies different from their competitors and difficult to imitate in the marketplace. The core competences have a strategic value, which implies a need to update them continually (Alfaro et al., 2017).

The research of Teece et al. (1997) extended the knowledge of resource-based view by proposing the concept of "dynamic capabilities," which they defined "as the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments." Dynamic capabilities may demonstrate the organization's ability to achieve new and innovative forms of competitive advantage, given path dependencies and market positions (Leonard-Barton, 1992). Those dynamic capabilities are especially useful in the current complex and changing context.

The present study is inclined toward the integrated view presented by Del Río et al. (2016) who claimed that the environmental business strategies adopted by a firm resulted from the use of external and internal factors. Then the implementation of those strategies drives the emergence of eco-innovations and organizational changes to facilitate the creation of competitive advantage in the market (Figure 3).

As soon as SMEs are provided with different RCCs that help them to deal with environmental challenges, they can advance in their EMM level. In 2015, Ormazabal et al. (2016) proposed an EMM model, which has its roots in nearly a dozen maturity models and focuses on the path a firm can follow to move from one stage to another:

1. Legal requirements: The company identifies the environmental requirements that it has to fulfill and it starts fulfilling them.
2. Responsibility assignment and training: Assign a person in charge of environmental management that consequently will assign responsibilities and will manage the necessary training, which will lead to the fulfillment of almost all legal requirements.
3. Systematization: Formalization of the environmental management, which include the environmental policy definition, implementation, and verification.



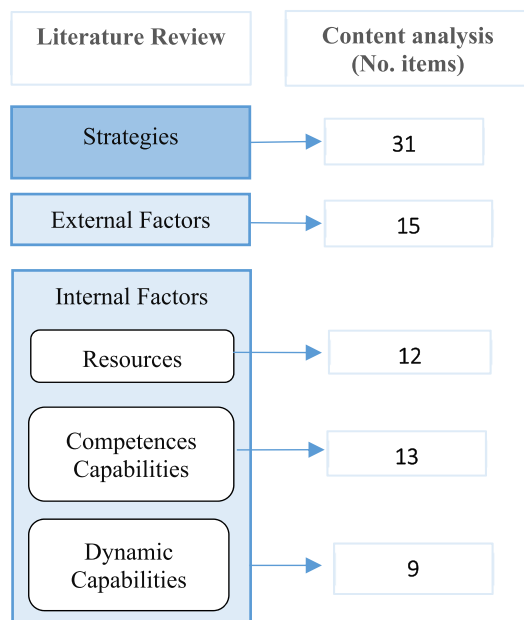
**FIGURE 3** Competitive advantage model for circular economy (CE) achievement, based on Ormazabal et al. (2016), Del Río et al. (2016), and Lepak, Smith, and Taylor (2007). EMM, environmental management maturity [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

4. ECO2: Minimize environmental impacts through a proactive attitude, implementing a continuous improvement system focused on environmental aspects.
5. ECO-Innovative products and services: Create new products and services that take into account environmental aspects.
6. Leading green company: Become a reference company in matter of environmental management through communication and marketing.

Consequently, a company would have a different combination of internal and external factors according to its EMM level, and a company can evolve in the time by improving its RCC (Figure 3). A company's understanding of its maturity level can help it to look for the resources, competences, and dynamic capabilities needed to improve its environmental strategies, create a competitive advantage, and consequently, create and capture value (Lepak et al., 2007). For this reason, SMEs should identify the resources, competences, and dynamic capabilities that are useful for implementing the CE through an environmental business strategy and that allow them to build a competitive advantage (Del Río et al., 2016). Thus, achieving a CE scheme must be attractive to the SMEs and help them to compete successfully in the market (Figure 3).

### 3 | METHODS

After undertaking a literature review to understand the theoretical background of the CE that allows SMEs to build a competitive advantage, we developed a mixed-method approach in this study (Figure 4). The data were gathered through a focus group via audio-visual and



**FIGURE 4** Results obtained during the data analysis in terms of the concepts from the literature review [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

written materials. The data collected from the focus group were analyzed with a systematic content analysis using the ATLAS.ti software.

#### 3.1 | Focus group

Focus group discussions are a flexible research method that is particularly effective for exploratory studies and for observing diverse experiences and perspectives on a topic of study. Moreover, focus groups give participants the opportunity to engage in a discussion, and they provide researchers with a broader range of information than surveys do (Hennink, 2014).

We invited 19 experts to participate in our focus group, and 12 accepted (a 63% acceptance rate). The focus group consisted of researchers and practitioners from universities (four), sustainable industrial SMEs (four), and consultancy firms (four) in Spain. The moderators were researchers who have been practitioners in industrial companies. Their fields of study are industrial engineering, environmental management, quality, and logistics. Participants were divided into three groups, taking into consideration the profile, age, and experience of each participant to ensure diversity and gender balance in each group. Each group had at least one male and one female and one researcher, one practitioner, and one consultant. Additionally, the audio-visual and written materials collected from the focus group workshops were analyzed through a systematic content analysis.

The focus group was organized as a workshop to generate interaction. The participants had to identify the most important stakeholders in implementing the CE in SMEs. Then they proposed strategies regarding the CE's six fields of action. During the workshop, three activities were completed:

1. The first activity was designed to stimulate self-reflection and facilitate socialization among them. For each group, the moderator invited the group's practitioner to describe their firm's production process as it existed at that moment and to draw the process on a big sheet of paper, without thinking about any improvements that could be made. This activity took 15 min.
2. The moderators made a brief presentation about the CE's purpose, fields of action, advantages to companies, and examples. At that point, participants had to list the most critical stakeholders, strategies, and indicators for each CE field. Participants also wrote down the internal and external factors that support the strategies, which may help SMEs to implement the CE. This activity took 90 min.
3. The final activity was geared toward thinking about the processes that the groups had drawn in the first activity and proposing the strategies identified in the previous activity for their own business. This task aimed to make participants develop a new awareness about the external and internal factors in their context. This activity took 20 min.

The focus group made it possible to integrate researchers' theoretical knowledge with practitioners' experience.

**TABLE 1** Strategies/activities for implementing circular economy in small and medium enterprises combined with EMM stages

Fields of action	Strategies/activities per EMM stage (excluding the first stage)				
	Assignment	Systematization	ECO2	ECO-Innovative	Leading green company
Take		Materials traceability Green procurement Corporate social responsibility	Avoidance of the use of toxic materials. Process and product transparency	Embrace the use of sustainable materials	Use of sustainable and fully recoverable materials
Make/transform	Training and of employees in sustainability issues	Minimizing the environmental impact by the resources optimization	The use of sustainable energy sources Prevention of environmental damage	The design of circular and sustainable products Collaborative product design. Ecological modernization	Zero-waste processes Company digitalization toward industry 4.0 improvements
Distribute			Optimization of stock, routes, and space	Local market promotion	Collaborative reverse logistics
Use/consume	Reaction to consumer requests on environmental issues	Products certifications such as eco-labels	Communication of environmental initiatives	Green marketing strategy Market segmentation	Product system services implementation
Recover			Waste management and in the suitable treatment of the various types of waste	Valorization of waste and energy	Valorization and commercialization of by-products and surplus electrical and/or heat energy to another consumer
Industrial symbiosis				Integration with other stakeholders to share materials and potential by-products	Complete integration of resources and energy with other stakeholders

Abbreviation: EMM, environmental management maturity.



### 3.2 | Systematic content analysis

The audio-visual and written materials collected during the focus group sessions were analyzed with a systematic content analysis. Content analysis involves organizing large quantities of textual or audio-visual data into many fewer and representative content categories (Krippendorff, 1989; Weber, 1990). Video recording focus group discussions are not usual, and it can give additional information about participants' body language or information that was not caught in the moment (Hennink, 2014). Additionally, the video is useful for transcribing the discussion or analyzing it with researchers that were not present. However, the presence of a video recorder can influence participants' contributions (Hennink, 2014). Bearing this in mind, we tried to decrease its influence by using a little camera and locating it in an unobtrusive area of the room.

The information collected from the focus group sessions was recorded systematically by creating a set of codes that defined items observed in the data and the literature review (Figure 4) according to the objectives outlined previously. Therefore, regarding the literature review and the key concepts to formulate and strategy toward the CE implementation, the content analysis identified different items for each of them: strategies, external factors, internal factors, and dynamic capabilities. This analysis was done using ATLAS.ti, a software program that supports qualitative research and qualitative data analysis.

## 4 | RESULTS AND DISCUSSION

As Section 1 shows, CE-related strategies can help SMEs to improve their business and environmental performance; thus, this study makes a major contribution to research on the CE implementation by providing a set of key strategies needed to incorporate the CE paradigm in firms, according to six fields of action. Then the study's results in terms of the main internal and external factors that support that set of strategies are discussed. Finally, an unanticipated finding is presented: a group of dynamic capabilities useful for implementing the CE in SMEs.

### 4.1 | Strategies for the CE fields of action

SMEs should design and implement multiple strategies and activities that fit with their available RCCs and of course their EMM level, so they can then build a proper corporate strategy that lets them build a competitive advantage within the framework of CE.

The focus group proposed several strategies and related activities that SMEs could apply for each CE field of action. These strategies also can be combined with the EMM stages to assist SMEs in the implementation process (Table 1). In the *take* field of action, the strategies are mainly oriented toward managing materials provision, which can be assessed according to the materials' toxicity, the suppliers' certifications, and the entire life cycle assessment. In this vein, a "leading green company" should use sustainable and fully recoverable materials. Moreover, the participants pointed out the importance of being

coherent by integrating CE implementation with a firm's corporate social responsibility strategy. They considered that every environmental strategy should go together with workforce conditions and the social sustainability of the firms. This collective agreement contrasts with Murray, Skene, and Haynes (2017), who question the social dimension of the CE paradigm.

In the *make* field of action, the strategies have the aim of triggering the design of circular and sustainable products and the technological modernization that may facilitate a financial advantage based on circular and efficient processes. Nonetheless, the participants commented that the less skilled jobs will disappear. In this field, a useful strategy is to design training policies that will help workers transition to positions and tasks that are in line with the firm's move toward the CE. As Forstater (2006) noted, "the ongoing jobs versus the environment mindset needs to be replaced with jobs and the environment attitude." Thus, sustainable SMEs may create new "green jobs," meaning traditional jobs will be transformed, but employees should not be fired. Instead, employees should be provided with training in the environmental knowledge they need (Renner, Sweeney, & Kubit, 2008).

In the *distribute* field of action, distribution can be improved using strategies related to supply chain management and its optimization through collaboration initiatives. Strategies for the *use* field of action are focused on communicating the value added by the SMEs through green marketing tools such as eco-labeling and zero-waste certifications. Moreover, market segmentation is a key strategy because not all green customers are the same green consumers (Ginsberg & Bloom, 2004) and not all customers care about the environment (Paço & Raposo, 2010). SMEs may adopt a product system service business model to sell their service instead of products. Then the strategies of the *recover* field of action should pave the way to do the valorization and commercialization of by-products and surplus electrical and/or heat energy to another consumer. However, this strategy clearly depends on the technological modernization of the company and its integration with other stakeholders. Consequently, the participants highlight the importance of *industrial symbiosis* strategies that should focused on build and integrated flow of resources and energy with other stakeholders.

### 4.2 | External and internal factors

As discussed in Section 2.1, external factors include public policy, market conditions, technological development, and stakeholders, whereas internal factors are the firm's RCC. The focus group identified internal and external factors that may be useful in developing SMEs' environmental strategy and boost CE implementation.

First, the stakeholders as the main external factors were directly analyzed by the focus group in the second activity, and they were also associated with each CE field of action (Table 2).

In the *take* field of action, the participants believed that suppliers and competitors are the most important stakeholders. The participants explained that the industry resource suppliers are not usually interested in the development or exploitation of sustainable materials

**TABLE 2** Stakeholders involved in implementing circular economy in small and medium enterprises

Fields of action	Stakeholders
Take	<ul style="list-style-type: none"> <li>• Suppliers</li> <li>• Competitors</li> </ul>
Make/transform	<ul style="list-style-type: none"> <li>• Investors and organizational leaders</li> <li>• Governments</li> <li>• Standards organizations such as BSI and AENOR</li> <li>• Universities and research centers</li> <li>• Design schools</li> <li>• Workforce</li> </ul>
Distribute	<ul style="list-style-type: none"> <li>• Logistics suppliers</li> </ul>
Use/consume	<ul style="list-style-type: none"> <li>• Shoppers</li> <li>• Consumers and final users</li> <li>• Second-hand users</li> <li>• Grouped consumers</li> <li>• The product-responsible organization</li> </ul>
Recover	<ul style="list-style-type: none"> <li>• Waste manager</li> <li>• Landfill managers</li> </ul>
Industrial symbiosis	<ul style="list-style-type: none"> <li>• Suppliers</li> <li>• Competitors</li> <li>• Consumers</li> <li>• Industrial or trade associations</li> </ul>

and they believe that suppliers should give more information about their processes activities. Additionally, they realized that regardless of whether leading competitors use environmental criteria, their attitude has a great influence on the whole market.

CE requires new knowledge and eco-innovation processes that are not always developed inside firms (internal factors; Teece et al., 1997). The focus group identified universities, research centers, and design schools as key stakeholders in facilitating eco-innovation in SMEs. Preliminary work on this issue was undertaken by Horbach, Oltra, and Belin (2013), who demonstrated that compared with another kind of innovations, firms require more external sources of knowledge and information to develop eco-innovative processes and products. They found that the external sources may be the businesses' suppliers, consulting firms or research and public institutions; the weight of these sources can vary according to the local context. Moreover, the focus group also remarked on the importance of the workforce profile and values in carrying out sustainable initiatives. One of the practitioners said, "I aim to introduce environmental consciousness into my employees' DNA and make it part of our culture."

In the third CE field of action (*distribute*), participants considered that logistic suppliers play a central role because they are related to polluting processes such as transport. For the *use* field of action, the focus group presented multiple agents: the shopper who buys the product, the consumer, the second-hand user, the grouped consumers or consumers that group their orders to increase their negotiation power, and the "product-responsible organization," if the consumer is not the owner. In general, all of these agents compose the demand side and can pressure companies for sustainable production. The *recovery* field of action is closely linked to the agents that can manage or transform waste streams, such as waste managers at landfills or incineration sites. Two of the participants represented SMEs that are legally accredited as waste managers because their business model requires direct access to materials that can be valorized, such as batteries and electronic waste. They highlighted that the low prices for landfill services are a barrier to the CE. Last but not least, the industrial

symbiosis should be supported by multiple stakeholders to facilitate the waste and resource sharing in a steady flow. Besides, the industrial associations may facilitate this integration, especially for the SMEs.

In the third column, Table 2 shows four transversal agents who can influence CE implementation in all fields of action. The participants first highlighted the role of investors and organizational leaders. As Rizos, Policy, and Ceps (2015) pointed out, the leaders of SMEs should be engaged in environmental values and understand the circular business model as a way to be more effective and efficient in the long term. As expected, the government was recognized as the agent that can change the rules of the game (Horbach, 2008; Reisch, Nielsen, Watson, & Wilson, 2016), an example of this being the European Union's roadmap to achieving a CE (European Commission, 2015b). The focus group recognized the strong influence of standards organizations such as BSI and AENOR in environmental management in the industry because they both are developing zero-waste standards to certify companies locally and globally (AENOR, 2016; BSI Group, 2017). Last but not least, there are industrial or trade associations who can help SMEs to develop industrial symbiosis (Ormazabal et al., 2016) and may play the role of innovation intermediaries (Alfaro et al., 2017).

Turning to the internal factors, they were identified tacitly; rather than asking direct questions, the focus group moderators encouraged participants to express the kinds of resources, competences, and capabilities that should support CE implementation in SMEs. The most useful resources, competences, and capabilities identified are listed in Table 3.

In the first field of action, the resources required by SMEs are a qualified procurement department that looks for sustainable supplies and a materials database that meets those criteria. Practitioners from SMEs expressed strong interest in specific innovations for improving the *take* field of action, and they criticized the low availability of sustainable materials in the market for producing green products. Moreover, practitioners believe that design and creativity are critical to developing competitive, green, and circular products or services. Unexpectedly, all participants agreed on the need for a human



**TABLE 3** Resources, competences, and capabilities in implementing circular economy in small and medium enterprises

Fields of action	Resources	Competences and capabilities
Take	<ul style="list-style-type: none"> <li>• Procurement department</li> <li>• Materials database</li> <li>• Design and creativity</li> <li>• Human resources department</li> </ul>	<ul style="list-style-type: none"> <li>• Develop successful, green, and circular products or services</li> <li>• Understand the competitors' strategy</li> <li>• Ability to attract talent with environmental values</li> </ul>
Make/transform	<ul style="list-style-type: none"> <li>• Machinery and equipment</li> <li>• Users' designs</li> </ul>	<ul style="list-style-type: none"> <li>• Project management</li> </ul>
Distribute	<ul style="list-style-type: none"> <li>• Traceability systems</li> </ul>	<ul style="list-style-type: none"> <li>• Perform reverse logistics</li> <li>• Share logistics operations with other organizations</li> <li>• Manage traceability</li> </ul>
Use/consume	<ul style="list-style-type: none"> <li>• Market analysts–business intelligence (e.g., omnichannel)</li> <li>• Maintenance services platform</li> <li>• Communication channels</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance services offer</li> <li>• Develop effective green marketing to open new markets</li> <li>• Include consumers in product design</li> </ul>
Recover	<ul style="list-style-type: none"> <li>• Reusable and recyclable products and materials</li> </ul>	<ul style="list-style-type: none"> <li>• Design circular processes and products</li> </ul>
Industrial symbiosis	<ul style="list-style-type: none"> <li>• Geographical proximity with the own firm factories, suppliers, customers, and potential partners</li> <li>• Communication channels</li> </ul>	<ul style="list-style-type: none"> <li>• Create synergies with compatible organizations</li> <li>• Work in symbiosis in the firm and with stakeholders</li> </ul>

resources department with the ability to attract talent with environmental values.

In the *make* field of action, the resources are clearly associated with the production process and systems; this involves the effective use of machinery and equipment. Besides, the collaboration with users may enrich the process, as well as the geographical proximity within the same company (be in the same building if possible) and with suppliers to create synergies with compatible organizations. Also, project management is a valued competence because it allows for the creation of products and services that fit market needs. For the *distribute* field of action, SMEs require traceability systems to perform reverse logistics, to share logistics operations with other organizations, and of course, to manage traceability. After that, in the *use* field of action, practitioners also suggested employing market analysts and using business intelligence platforms (e.g., omnichannel) to review demand behavior and to correct the production plan. If the company has a product service business model, it needs a maintenance services platform so it can offer those services. Also, in this field of action, an effective communication channel is essential to develop effective green marketing to open new markets and to include consumers in their product design. The *recover* field of action requires access to reusable and recyclable products and materials to design circular process and products. Finally, the *industrial symbiosis* needs geographical proximity within the same company (be in the same building if possible) and other compatible organizations to share resources and wastes. Additionally, the industrial symbiosis would be well supported by effective communication channels.

### 4.3 | Dynamic capabilities

One unanticipated finding was that the analysis of participants' opinions facilitated the identification of some useful dynamic capabilities for implementing the CE in SMEs, as Table 4 shows. According to Teece (2007), “dynamic capabilities enable business enterprises to

**TABLE 4** Dynamic capabilities for implementing circular economy in small and medium enterprises

Objective	Dynamic capabilities
Sense and shape opportunities and threats	<ul style="list-style-type: none"> <li>• Access to stakeholders' information</li> <li>• Research and development</li> </ul>
Seize opportunities	<ul style="list-style-type: none"> <li>• Improvement of the business models</li> <li>• Ability to create a “green” culture</li> <li>• Ability to train and increase workers' ability to propose improvements</li> <li>• Capability to transform obsolete jobs into new employment</li> </ul>
Maintain competitiveness	<ul style="list-style-type: none"> <li>• Leader's vision and environmental awareness</li> <li>• Capacity to design and reconfigure sustainable business models</li> <li>• Knowledge management and development</li> </ul>

create, deploy, and protect the intangible assets that support superior long-run business performance,” meaning that dynamic capabilities enable firms to be adaptable and responsive to dynamic environments. Likewise, Teece (2007) suggested that there are three kinds of dynamic capabilities: (a) sensing and shaping opportunities and threats, (b) seizing opportunities, and (c) maintaining competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets.

Those three kinds of dynamic capabilities may help entrepreneurs and SMEs achieve and maintain a competitive advantage when facing the challenges mentioned above, namely, limited technical and financial resources and a short-term outlook (Ormazabal et al., 2016).

With regard to sensing and shaping opportunities and threats, the focus group activities showed that participants believed that SMEs should increase their access to stakeholders' information in order to understand their needs as well as increase their research and

development programs and identify better technologies and opportunities for closing the resource and material loops.

Second, in terms of seizing opportunities, three dynamic capabilities were identified: incremental improvement of the business model, the ability to create a “green” culture and boost it from inside the SMEs, and the training of workers to increase their ability to propose improvements. In addition, SMEs should develop the capability to transform obsolete jobs into new employment through training and without redundancies. On this last point, the participants expressed concern about the social implications of the modernization of companies and the threat that it can entail for older employees in any industry.

Finally, turning to the capacity to maintain competitiveness, the focus group highlighted the vision and environmental awareness of leaders. Moreover, SMEs should develop the capacity to design and reconfigure sustainable business models according to their CE opportunities and challenges. Lastly, participants agreed that knowledge management and development should be continuously fed by future/potential users through virtual platforms.

## 5 | CONCLUSIONS

The central goal of the study was to identify the key strategies and resources that may favor the CE paradigm in SMEs. This work contributes to the existing knowledge on CE implementation by providing a set of 31 strategies that could help SMEs to mature and orient their corporate strategy toward the CE. The strategies were classified in terms of the six CE fields of action and the EMM level identified through a literature review. Moreover, this set of strategies is supported by a group of internal and external factors that are also organized according to the CE fields of action. The second major finding was some useful dynamic capabilities that may help SMEs or any company to build a sustainable competitive advantage. More research is needed to understand better the dynamic capabilities, which may not be limited to the ones we proposed and which vary according to the internal and external factors of each organization.

These findings may help SMEs owners and managers to understand what combination of resources, competencies, and capabilities they should obtain to mature in its environmental management. Consequently, SMEs would design strategies to eco-innovate and achieve organizational changes that lead them to incorporate the CE.

Further research should be done to investigate the key role of consumers in the change of paradigm because the focus group participants were concerned about the importance of including them in the *make* and *recover* fields of action.

Finally, this study presents some limitations regarding its applicability. The set of strategies, resources, external factors, and dynamic capabilities could be useful for all type of industrial companies and their departments; however, it is especially focused on SMEs. Besides, this focus group was formed with representative experts of Spain, so it could be convenient to duplicate this experience in different countries

and economic sectors to facilitate the change of paradigm to the CE in different contexts.

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## ORCID

Carmen Jaca  <https://orcid.org/0000-0002-8438-5387>

Marta Ormazabal  <https://orcid.org/0000-0002-3602-3912>

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